Chemical & Metallurgical Engineering

VOLUME XLVII

From January to December

1940

Published monthly by

McGRAW-HILL PUBLISHING COMPANY, INC.

NEW YORK

M. A. WILLIAMSON
Publisher
JAMES A. LEE
Managing Editor
HENRY M. BATTERS
Market Editor
THEODORE R. OLIVE
Associate Editor
MELVIN E. CLARK
Assistant Editor

CHEMICAL & METALLURGICAL ENGINEERING

LESTER B. POPE
Assistant Editor
R. S. McBRIDE
Washington
PAUL D. V. MANNING
San Francisco
E. S. STATELER
Chicago
EARLE MAULDIN
Atlanta

S. D. KIRKPATRICK, *Editor*

Chemical & Metallurgical Engineering is the successor to *Metallurgical & Chemical Engineering*, which, in turn, was a consolidation of *Electrochemical & Metallurgical Industry* and *Iron & Steel Magazine*. The magazine was originally founded as *Electrochemical Industry*.

McGRAW-HILL PUBLISHING COMPANY, INC., NEW YORK CITY

Volume XLVII

January to December, 1940

GENERAL ALPHABETICAL INDEX

January 1– 60
February 61–146
March 147–216
April 217–282
May 283–390
June 391–456
July 457–526
August 527–594
September 595–670
October 671–738
November 739–822
December 823–894

A

Abrasion-resistant materials for construction—report with supplement.....*597
Absorption—Bubble phase absorption of sulphuric acid fog.....*541
Reich absorption process for recovery and concentration of carbon dioxide from flue gases. G. T. Reich.....*152
Acetic acid—Flow sheet of acetic acid from wood distillation.....*349
What metals to use with acetic acid. Pavlis & Rohrman.....*779
Acetic anhydride process. G. Benson.....*150
Adsorption—Air conditioning survey..*285–332
Leather cloth from chemicals. M. E. Clark *544
Agitator, side-entering (E.N.).....*633
Air Conditioning:
Absorbent solutions for dehydration of air or gas. F. R. Bichowsky..... 302
Activated alumina to dry air. G. L. Simpson *310
Activated carbon adsorption. C. L. Mantell *305
Calcium chloride for dehydrating air.*304
Choice of dehydration methods. J. C. Patterson *313
Compression equipment. Z. G. Deutsch*317
Condensation by refrigeration. J. W. Hunter *300
Dehydration methods for air conditioning *312
Drying of air and gases by dehumidification discussed at A.S.M.E. meeting *228
Heat transfer surfaces. C. M. Ashley *319
History of air conditioning..... 286
Humidification processes.....*315
Humidity damage to buildings and means for its prevention. Downs & Spiselman *620
Lithium chloride for absorbing moisture for air (charts).....*302
New psychrometric chart. D. F. Othmer 296
Principles and types of air conditioning *325
Silica gel adsorption for drying air. F. C. Dehler.....*307
Special section *285–332
Types of psychrometric charts..... 293
Use of psychrometric principles. Barta & Garber (charts).....*287
Air eliminator (E.N.)..... 357
Air washer, capillary (E.N.).....*696
Alcohol—Ethyl alcohol production (tables & charts) 1937–39..... 84
Alumina, activated, adsorption. G. L. Simpson *310
Aluminum—Making alumina at Mobile. J. A. Lee.....*674
Making alumina flow sheet.....*707
Aluminum salt shipments..... 360
American Chemical Society—Cincinnati meeting 259
Cincinnati meeting 45
Report of 100th meeting..... 650
American Institute of Chemical Engineers—Buffalo meeting.....*342
American Management Association—Chart for cost reduction in an industrial engineering plant..... 476
Ammonia:
Ammonia vs. nitre (ed)..... 672
Nomographicplotting proves convenient for vapor pressure and composition data. D. F. Othmer (P.N.) 631
Plotting vapor pressure data for aqueous ammonia. D. F. Othmer (P.N.) *551
Amyl alcohol, synthetic, and acetate—flow sheet *493
Antifreeze, ethylene glycol..... 711
Arsenic—Colorimeter method for determining arsenic 45
Associations—Self-starting juniors (ed).. 2
Auditors and engineers. P. O'Tash (c).. 48
Awards:
Lalor Foundation announces winners of awards 364
Modern Pioneer awards (ed)..... 82
Modern Pioneers (ed).....148; *194
Willard Gibbs medal awarded to Prof. V. N. Ipatieff.....*433

B

Belt, link leather (E.N.).....*423
Belts—Report on mechanical power transmission *481
Bins:
Avoiding clogged bin hoppers. C. O. Sandstrom *22
Avoiding clogged bin hoppers. W. F. Schaphorst (c) 132
Bin level indicator (E.N.).....*182
Flow through bins. C. A. Lee (c)..*198
Hopper intersection angle solved with compound angle graph. P. W. Jacobsen (P.N.) 480
Blender, stainless steel (E.N.).....*356
Boiler burner unit (E.N.)..... 788
Boiler return system (E.N.).....*788
Blower, general-purpose (E.N.).....*251
Boiler feedwater treatment trends. F. G. Straub *477
Book Reviews:
A.S.T.M. standards on rubber products 273
A.S.T.M. standard specifications for classification of coal as applied to Canadian coals 50
Advanced readings in chemical and technical German, ed by Fotos & Shreve 378
Alcoholic beverage and industrial alcohol regulations..... 582
American fertilizer practices. H. R. Smalley & others..... 376
American Gas Association proceedings 447
Annual statistics of gas industry..... 49
Applications of chemical engineering, ed by H. McCormack..... 807
Applied x-rays. G. L. Clark..... 807
Boiler feed water treatments. F. J. Matthews 374
Bottlenecks of business. T. W. Arnold 882
Brown's directory of American gas companies 727
Calcium superphosphate and compound fertilizers. Parrish & Ogilvie 376
Cast metals handbook..... 272
Catalysis, inorganic and organic. Sophia Berkman, J. C. Morrell & Gustav Egloff 882
Chambers' technical dictionary, ed by Tweney & Hughes..... 807
Chapters in the chemistry of the less familiar elements. B. S. Hopkins.. 445
Chemical calculations. Long & Anderson 379
Chemical constitution of natural fats. T. P. Hilditch..... 807
Chemical industries, 1940, ed by D. M. Newill 658
Chemische-technische untersuchungsmethoden, erganzungswerk zur achten auflage 133
Chemist at work. R. I. Grady & others 447
Chemistry in warfare; its strategic importance. F. A. Hessel & others. 579
Chemists' year book. E. Hope..... 446
Coal—its properties, analysis, classification, geology, extraction, uses and distribution. E. S. Moore..... 579
Coal utilization papers..... 49
Collected papers on the teaching of chemical engineering..... 728
Collected papers of Wallace H. Carothers on polymerization, ed by Mark & Whitby..... 725
Color atlas for fiber identification. J. H. Graff..... 271
Conversion of petroleum. A. N. Sachanen 503
Corrosion of iron and steel. J. C. Hudson 654
Course in general chemistry. Bray & Latimer 136
Detection and identification of war gases 270
Dictionary of metals and their alloys, ed by F. J. Camm..... 512
Dictionary of paper..... 579
Effect of sulphur dioxide on vegetation 511
Einleitung in das studium der chemie. J. Remsen 135
Electrocapillarity. J. A. V. Butler.. 656
Electrochemistry and electrochemical analysis. H. J. S. Sand.....271; *655
Electronic processes in ionic crystals. Mott & Gurney..... 580
Elementary quantitative analysis. Willard & Furman..... 579
Engineering materials. A. H. White. 200
Engineering opportunities, ed by R. W. Clyne 374
Experimental chemistry for colleges. Harris & Ure..... 809
Experiments in colloid chemistry. Hauser & Lynn..... 727
Fabrication of U.S.S. stainless steels 272
Farmward march. W. J. Hale..... 200
Fuel—flue gases, ed by C. G. Segeler 270
Gas purification 50
Graphic presentation. W. C. Brinton 134
Handbook of chemical microscopy. Chamot & Mason..... 374
Handbook of chemistry and physics, ed by Hodgman & Holmes..... 809
Handbook of English in engineering usage. A. C. Howell..... 725
Handbook of mathematical tables and formulas, comp. by R. S. Burington 654

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.

E. Eng Lib.
Wilson

Heating ventilating air conditioning guide 1940 136
Impact cleaning. W. A. Rosenberger 204
Index to A.S.T.M. standards and tentative standards 379
Industrial electrochemistry. C. L. Mantell 508
Industrial health. C. O. Sappington. 52
Inorganic and analytical chemistry. E. J. Baldwin 655
Kinetics of chemical change. C. N. Hinshelwood 508
Kingzett's chemical encyclopaedia, ed by R. K. Strong 725
Lecture demonstrations in general chemistry. Paul Arthur 136
Life of Ira Remsen. F. H. Getman.. 725
Lubricants and lubrication. J. I. Clower 200
Manual for the design of ferrous and non-ferrous pressure vessels. Karl Sienan 883
Manual of industrial health hazards. J. B. Ficklen 443
Manual of sugar companies 727
Materials handbook. G. S. Brady.... 882
Mathematical methods in engineering. Karman & Biot 270
Mathematical theory of non-uniform gases. Chapman & Cowling 133
Merck index 580
Meter, kilogram and second, units and dimensions. Jauncey & Langsdorf. 205
Microscope. R. M. Allen 202
Micro-diffusion analysis and volumetic error. E. J. Conway 375
Mineral industry during 1939, ed by G. A. Roush 808
Mines register 579
Modern export packing—1940. Joseph Leeming 658
Money-making formulas, ed by C. A. Crowley 378
Mr. Tompkins in Wonderland. G. Gamow 656
National fire codes for the prevention of dust explosions 379
New dictionary of chemistry, ed by Stephen Miall 657
Official and tentative methods of analysis of the A.O.A.C. 727
Organic reagents used in quantitative inorganic analysis. W. Prodinger... 726
Organic syntheses. C. F. H. Allen.. 379
Outline of metallurgical practice. C. R. Hayward 580
Phenomena at the temperature of liquid helium. E. K. Burton & others 654
Physical chemistry. L. J. Bircher.. 807
Physical constants of hydrocarbons. Gustave Egloff 443
Physical examination of metals. Bruce Chalmers 133
Physical organic chemistry. L. P. Hammett 445
Physical sciences. E. J. Cable & others 657
Physico-chemical methods. Riley & Rae 443
Pioneers of plenty. Christy Borth.... 49
Plastics in engineering. J. Delmonte 443
Possibilities of research in the gasification of coal. C. A. Barnes 50
Practical latex work. H. J. Stern.. 655
Practical microscopical metallography. Greaves & Wrighton 376
Principles of chemistry. J. H. Hildebrand 135
Printing inks. Carleton Ellis 443
Procedure handbook of arc welding design and practice 378
Proceedings of the forty-second annual meeting A.S.T.M. 446
Productivity wages and national income. Spurgeon Bell 509
Properties of ordinary water-substance, comp by N. E. Dorsey..... 270
Pumps. F. A. Kristal & F. A. Annett 882
Purging of gas piping and gas apparatus 510
Qualitative analysis by spot tests. Fritz Feigl 202
Quantitative analysis. Booth & Damerell 446
Raman effect and its chemical applications. J. H. Hibbon 133
Rancidity in edible fats. C. H. Lea... 270
Reference book of inorganic chemistry. Latimer & Hildebrand 272
Refining precious metal wastes. C. M. Hoke 204
Research in fundamentals of atmospheric gas burner design 808
Rubber latex. H. Stevens & W. Stevens 374
Science for the world of tomorrow. Gerald Wendt 50
Scientific price management. A. W. Rucker 725
Silver in industry. Lawrence Addicks 725
Soap manufacture. J. H. Wigner..... 654
Solubility of inorganic and metal organic compounds. Atherton Seidell 808
Specific and special reactions for use in qualitative analysis. F. Feigl.... 658
Statistical thermodynamics. Fowler & Guggenheim 203
Storehouse of civilization. C. C. Furnas 51
Story of superfinish. A. M. Swigert, Jr. 726
Sulfated oils and allied products. Burton & Robertshaw 270
Symposium on lime 273
Symposium on the combustion of solid fuels 49
Symposium on thermal insulating materials 272
Technical Association papers, ed by Macdinald & Waters 655
Technical exposition. L. M. Oliver.. 884
Text-book of physical chemistry. Samuel Glasstone 728
Theoretical electropchemistry. N. A. McKenna 51
Tools of the chemist. Ernest Child.. 374
Unit operations laboratory equipment. Zimmerman & Lavine 579
Varnish making 510
Volumetric and phase behavior of hydrocarbons. Sage & Lacy 581
Whale oil, an economic analysis. Karl Brandt 654
Where to find the new trade names. Alice M. Amoss 205
Your income tax. J. K. Lasser 135
Box tramrail carrier (E.N.) *425
Brewing—Hydrogen ion measurement report *553
Bromine—Hydrogen ion measurement report *553
Business Week's weekly index of business activity 1929-1939 (chart).... 66

C

Calcium chloride—Dehydrating air with calcium chloride *304
Car puller (E.N.) *117
Carbon—Activated carbon adsorption in air conditioning. C. L. Mantell..... *305
Structural carbon and graphite (tables) 607
Carbon dioxide analyzer (E.N.) *786
Carbon dioxide from flue gases by Reich absorption process. G. T. Reich.. *152
Casein and lactic acid flow sheet..... *427
Caustic Soda:
Electrolytic cells in chlorine and caustic soda production. C. L. Mantell *166
Production of ammonia soda and electrolytic caustic soda in U. S. (chart). R. L. Murray 398
Production, distribution of caustic soda (charts & tables) 1937–1939.. 70
Soda ash and caustic soda in peacetime *750
Cement—Construction with sulphur cement. Payne & Duecker *20
Makers of cements and putties for acidproof brick and stoneware.... 605
Centrifugals—Beet sugar developments. R. W. Shafor *464
Continuous centrifugal (E.N.) *489
Ceramics:
Chemical stoneware flow sheet *637
Chemical stoneware, porcelain, cements—makers and physical properties 605
Physical properties of low-expansion glasses, fused quartz and fused silica (table) 604
Charcoal price-fixing case receives cease and resist order 644
Charcoal, processed, from wood waste.... 240
Chemical Engineering:
Federal Civil Service for chemical engineers (ed) 2
Find room for more "learners" (ed). 284
New engineering standards (ed)..... 459
Older ideas on "young engineering." T. M. Switz (c) 131
Professional ethics (ed) 2
Regularizing chemical employment (ed) 217
Results from "young ideas." Abbey, Gibbons (c) 267
Western opportunities for chemical engineers. P. D. V. Manning..... 613
Young engineering and young engineers (ed) 1
Young ideas on "young engineering" (c) 131
Chemical Industry:
Better price index (ed) 393
British industry at war. P. I. Smith. *12
Chemical consumption 1935–1939 (chart) 66
Chemical raw materials report..... 63–94
Chemicals' forward march! (ed)..... 740
Chemicals in the national economy—report by Chemical & Metallurgical Engineering (charts) *741
Decade of chemical progress in the U. S. 1929-1939 (chart supplement) Feb.
Diversified repair problems in chemicals manufacture. Miller & King (charts) *853
Ersatz—American style (ed)..... 528
Going into business for yourself. A. R. Maas *781
Gossiping about "bottlenecks" (ed)... 596
Italian autarchy almost achieved. Giacomo Fauser *10
Making America chemically self-sufficient (ed) 393
Niagara-Buffalo area—chemical process industries. MacMullin, Koethen & Richardson *338
Operation and management in making war-time chemicals. King, Bennett, Harney, Meller, Dooley, Jasper *762
Our own consumer movement (ed).. 283
Puerto Rico should be encouraged to grow raw materials which do not thrive in U. S. (ed) 459
Southern chemical activity. J. A. Lee. *826
Value of manufacturers' inventories, new orders and shipments (table) 1929–1939 67
What chemicals hold for the future? 754
Where are the plants that make chemicals? (charts) 756
World chemical plant construction affected by war developments last year 715
Chemical raw materials report..... 63–94
Chemical & Metallurgical Engineering:
Developments in the magazine compared with teaching developments in Purdue University. S. D. Kirkpatrick *394
Historical summary 3
Materials of construction number Sept.
Our plans and objectives (ed)..... 3
Redesigned for Spring (ed)..... 283
Report on chemical raw materials, ser. B, No. 2 63
Report on plant light, ser. A, No. 1.. 25
Report on plant lubrication, ser A, No. 2 ..... *171
Chemurgic Council highlights..... 240
Chlorine—Alkali-chlorine developments. R. L. Murray *396
Electrolytic cells in chlorine and caustic soda production. C. L. Mantell *166
Chromite—Producing chromite salts from domestic ores flow sheet..... 688
Clutch, automatic centrifugal (E. N.).... *35
Coke and Coal Products:
Byproducts obtained from coke-oven operations by the Reich from U. S. in 1939 (table) 500
Gas and coal products consumption, production (charts & tables) 1938.. 82
How to store coal to avoid spontaneous combustion (P.N.) 694
Maintenance organization avoids breakdown in plant. F. D. Lohr (chart) *857
Synthetic organic chemicals (charts & tables) 1925–1938 80
Coal-tar products—Production and sales of synthetic organic chemicals 1939 (table) 437
Compression equipment. Z. G. Deutsch.. *317
Compressor—Diesel driven (E.N.)..... *114
Gas-engine (E.N.) *35
Refrigeration (E.N.) 357
Two-stage (E.N.) *355
Consumer movement in the chemical industry (ed) 283
Containers—Developing a new container for a chemical product. R. W. Lahey *110
Controllers:
Electric level (E.N.) *491
Electronic pyrometer (E.N.)..... *698
Flame controller (E.N.)..... *179
Vernier speed (E.N.)..... *357
Conversion devices used by electrochemical industries near Niagara Falls. C. C. Levy *344
Conveyors—Conveyor drive (E.N.)..... *492
Horizontal (E.N.)..... *426
Mass-flow (E.N.)..... *179
Cooling towers—Humidification Processes. *315
Corrosion:
Materials of construction report with supplement *597
Neoprene for fan coating increases capacity (P.N.) 118
Welded steel vacuum pans for salt refining, instead of cast iron, show little corrosion. J. A. Lee..... *530
What metals to use with acetic acid. Pavlis & Rohrman *779
Costs—Depreciation vs. obsolescence. R. M. Fischer (c) 578
Materials obsolescence. G. M. Read (c) 578
Planning for cost reduction in an industrial engineering plant (chart).. 476
Creosoting cylinder (E.N.)..... *117
Crusher, multi-stage (E.N.)..... *115
Cyanamide production flow sheet..... *253

D

Defense, see War
Discharger, centrifugal (E.N.)..... 179
Distillation:
Flow sheet of acetic acid from wood distillation *349
Making lubricants with chemical added. D. M. Considine..... *230
Synthetic phenol made by vapor phase regenerative process. T. R. Olive.. *770
Dowtherm vapor system. R. E. Hulme.. *685
Drive, magnetic (E.N.)..... *116
Drive, variable speed (E.N.)..... *785
Drums—Construction of drums. M. F. Crass, Jr. (c) *578
Further improvements in drum construction *406
Drying:
Activated alumina adsorption. G. L. Simpson *310
Calculations for typical dryers. O. A. Hougen.....pt. I, *15; pt. 2, *160
Choice of dehydration methods. J. C. Patterson 313
Dehumidification for drying air and gases discussed at A.S.M.E. meeting *228
Dehydration methods *312
Drying psychrometry *332
Granulating phosphate fertilizer at Davison Chemical. Mackall & Shoeld *102
New Psychrometric chart. D. F. Othmer 296
Paint baking with near infra-red lamps. Bennett & Haynes..... *106
Types of psychrometric charts..... 293
Use of psychrometric principles. Barta & Garber (charts)..... 287
Vacuum dryer (E.N.)..... *787

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.

Dust and Fume Handling:
Bubble phase absorption of sulphuric acid fog *541
Cyclone dust collector (E.N.) *634
Dust collector, midget (E.N.) *180
Electrostatic air cleaner (E.N.) *115
Gas-cleaning equipment *321
How to store coal to avoid spontaneous combustion (P.N.) 694
Liquid-gas contactors. H. F. Johnstone *322
Wet disposal unit (E.N.) *785
Dyeing—Leather cloth from chemicals. M. E. Clark *544

E

Editorials:
Ammonia vs. nitre 672
An important distinction in chemical preparedness 392
Attention: second honeymooners 218
"Bankable" contracts for defense plants 595
Banking on research 825
Beat Congress to the draw 218
Better price index 393
Chemically self-sufficient 393
Chemicals' forward march! 740
Clashing philosophies of government and trade 61
College control of patents 149
Delineating deferment 824
Ersatz—American style 528
Fighting the saboteur 672
Find room for more "learners" 284
For engineering executives 147
For "purer" research 218
Good tool wrongly used 219
Gossiping about "bottlenecks" 596
Green lights for business 284
It's in the air 283
Job for Puerto Rico 459
Make haste slowly 671
Makings of good inspectors 672
Man-power for munitions 527
Matters of ethics 2
Mobilizing traffic plans 62
More federal taxes 459
New engineering standards 459
New Spring clothes 283
Ninth in the series 595
Opportunities 2
Our modern pioneers 148
Our own consumer movement 283
Our plans and objectives 3
Patents and fertilizers 62
Penalizing private enterprise 595
Preparedness begins at home 457
Preparedness and the engineer 739
Preparedness for D-day 823
Preparing for conscription 673
Professional zealots 148
Recognition and award 62
Regularizing chemical employment 217
Renewed pressure for unionization 528
Research—our greatest resource 391
Sabotage precautions 824
Scandinavian pulp 283
Self-starting juniors 2
Toward rubber self-sufficiency 458
Trail of the forty-niners 149
Upsetting status quo 529
Vital industrial minerals 148
War casualty? 62
Watch out for tanks 219
Watched pot 673
What of the aftermath? 673
What price toluol? 529
Young engineering and young engineers 1
Education—Twilight zone in education. R. E. Bowman (c) 370
Electrochemical Society—Ottawa meeting 692
Wernersville, Pa. meeting *353
Electrode, glass (E.N.) *117
Electrolytic cells in chlorine and caustic soda production. C. L. Mantell *166
Enameled building materials (E.N.) 33
Engineering—Plus engineering. H. A. Toulmin, Jr. (c) 48
Engineers—Magic as an engineer's hobby. J. J. Strobel (c) 48
Professional zealots (ed) 148
Engineers Council for Professional Development—Pittsburgh meeting 802
Equation for correlation of chemical engineering test data. D. S. Davis (P.N.) *249
Equilibrium calculations. Mitchell Gilbert (chart) *234

Equipment News:
Agitator, side-entering *633
Air eliminator 357
Air washer, capillary *696
Bag closer *787
Belt, link leather *423
Bin level indicator *182
Blender, stainless steel *356
Blower, general-purpose *251
Boiler-burner unit 788
Boiler return system *788
Box tramrail carrier *425
Car puller *117
Carbon dioxide indicator *786
Centrifugal, bulk *34
Centrifugal, continuous *489
Clutch, automatic centrifugal *35
Compressor, diesel driven *114
Compressor, gas-engine *35
Compressor, industrial *355
Compressor, refrigeration 357
Connectors *250
Control, electric level *491
Control, vernier speed *357
Controller, electronic pyrometer *698
Controller, flame *179
Controller, redesigned *426
Conveyor drive *492
Conveyor, mass-flow *179
Conveyor, Redler *426
Creosoting cylinder *117
Crusher, multi-stage *115
Discharger, centrifugal 179
Drive, magnetic *116
Drive, variable speed *785
Dryer, vacuum *787
Dust collector, cyclone *634
Dust collector, midget *180
Electrode, glass *117
Electrostatic air cleaner *115
Enameled building materials 33
Exhauster, straight-line *424
Fan, duct *36
Fan, housed propeller *35
Fan, man-cooling *491
Fan, remote-motored 33
Fan, ventilating 489
Feeder for dry chemicals *635
Filler, jar *115
Filter, high capacity *250
Filter, rubber-lined *787
Flaking drum *785
Flashlight storage battery 787
Flowmeter *634
Fluorescent unit, sealed 696
Gage, remote level *180
Gas absorber *356
Gas indicator, continuous *182
Gloves, neoprene *563
Grinder, cutting type *114
Gunite reinforcement 634
Heater, immersion *492
Heater, still *788
Heater, tantalum *355
Heating system *785
Hoist, air-cooled electric *697
Homogenizing unit *116
Hydrogen-ion equipment 635
Ilium thermocouple tubes *564
Impeller, agitating *698
Indicator, flow rate 117
Jack, flange *355
Joint, compact expansion 182
Joint, high-pressure *36
Joint, swing *564
Kettle, automatic processing *562
Kettle, electric process *114
Kneading machinery *423
Lamp, high capacity *698
Lubricator, automatic *490
Lubricator, electric *251
Magnetic equipment *636
Meter, area type *423
Meter, pH quinhydrone 561
Meter, ring-balance *424
Meter, rotary displacement *180
Mill, fluid impact *357
Mill, plastics *251
Mixer, experimental *786
Mixer, flocculating *181
Mixer, horizontal *424
Mixer, two-motion *490
Mixer with clamp *181
Molding press 117
Molding press, automatic *696
Molding press, injection *356
Motor generator *252
Motor, Lo-Amp. *426
Motor, synchronous *425
Motor, variable speed *33
Motor, variable speed drive *117
Multi-processing unit *491
Odor adsorber *252
Oil burner 182
Oil pressure unit *697
Packing, braided *562
Pillow block, anti-friction *489
Pipe, rubber-line *561
Planning for cost reduction (chart) 476
Press, injection molding *36
Psychrometer, hand aspirated *116
Pulp washer *250
Pump, duplex diaphragm *490
Pump, large proportioning *698
Pump, midget *635
Pump, multi-stage *698
Pump, neoprene rotary *633
Pump, packless *564
Pump, paper stock *182
Pump, portable submersible *115
Pump, proportioning *356
Pump, rotary *355
Pump, simplified slip *697
Pump, streamlined *181
Pump, stuffingboxless *491
Pyrometer, optical *117
Pyrometer, portable *634
Recorder, redesigned *564
Rectifier, selenium *36
Refrigeration machines, new 180
Respirator cartridges 36
Rotor, "Valv-amp" *356
Rubber-metal bond *250
Sand clarifier *563
Screen, electro-deposited *114
Screen, miniature vibrating *180
Separator, a.c. magnetic 787
Sheet metal construction *696
Sifter, brush *562
Speed reducer *425
Speed variator *636
Steam trap, large *116
Switch, electric furnace *180
Switch, explosion-proof *697
Switch, micro *357
Tank cars, lead-lined *490
Tank, butane handling *562
Tank, rubber-lined *563
Thermocouple, radiation type *252
Timer, flexible *786
Trailer, fire-fighting *787
Transformer, variable auto- *35
Truck, barrel *561
Truck, carboy *563
Truck, fork 633
Tubing fittings, stainless steel 250
Valve, diaphragm control *426
Valve heating element *635
Valve, high temperature 697
Valve operator *115
Valve, self-contained reducing *34
Valve, spinning-disk *179
Valve, steel *181
Valve, U-bolt gate 33
Valve, small steel *492
Vibrators, explosion-proof *179
Vibrators for cars *633
Vulcanizer *788
Welded fittings 357
Welder improvements *636
Welder, portable a.c. *696
Wet disposal unit *785
White print machine *423
Wire, braidless insulated 357
Evaporation—Beet sugar developments. R. W. Shafor *464
Synthetic phenol made by vapor phase regenerative process. T. R. Olive *770
Exhauster, straight-line (E.N.) *424
Exploding wood into fibers. J. A. Lee *95
Explosives—Explosions that weren't planned. Ernst Berl *236
National defense to make military explosives (chart) 744
Synthetic glycerine from petroleum. E. C. Williams & others *834
Exports and imports—Export and import trade in chemicals, by groups (table) 1929-1939 92

F

Fan—Duct (E.N.) *36
Housed propeller (E.N.) *35
Man-cooling (E.N.) *491
Remote-motored (E.N.) 33
Ventilating (E.N.) 480
Feeder for dry chemicals (E.N.) *635
Fertilizers:
Consumption, distribution, production of fertilizers (charts & tables) 1937-1939 72
Davison Chemical Corp. applies modern chemical engineering to fertilizer making. R. S. McBride *4
Davison Chemical produces granulated phosphatic fertilizer. Mackall & Shoeld *102
Patents and fertilizers (ed) 62
Filler, jar (E.N.) *115
Filtration—Filter, rubber-lined (E.N.) *787
High capacity filter (E.N.) *250
Financing—Plant-option plan of financing proposed by the National Defense Advisory Commission (ed) 595
Fire protection — Fire-fighting trailer (E.N.) *787
Fire hazard properties of certain flammable liquids, gases and solids (table) 31
Fire prevention and safety in chemical industry *700
How an acetate plant assures fire protection. M. B. Morgan *403
Fires—Extinguishing fires in the chemical industry *543
Extinguishing sodium fires. C. B. Hess (c) 306
Flaking drum (E.N.) *785
Flashlight storage battery (E.N.) 787
Flow Sheets:
Acetic acid from wood distillation *349
Acetic anhydride production 151
Chemical stoneware processing *637
Chrome salts from domestic ores 689
Cyanamide production *253
Furfural refining of lubricants *859
Gasoline by alkylation 226
Granulated phosphatic fertilizer 102
Lactic acid and casein *427
Laminating phenolic plastic *183
Making alumina *707
Modern sugar refining ..... *119; correction 371
Phenol-vapor phase regenerative process *789
Pyroxylin coated fabrics—leather cloth from chemicals. M. E. Clark *544
Removal of hydrogen sulphide *27
Salt production *565
Sequence of operators and flow of materials in the pulp and paper industry 245
Solutizer treater for gasoline sweetening 777
Synthetic amyl alcohol and acetate *493
Synthetic glycerine from petroleum. E. C. Williams & others *834
Flowmeter (E.N.) *634
Freight rates—Molasses freight rates changed by I.C.C. 41
Fume handling, see Dust and Fume handling
Furfural refining of lubricants flow sheet *859

G

Gage, remote level (E.N.) *180
Galvanic series in sea water 691
Gas:
Absorbent solutions for dehydration of air or gas. F. R. Bichowsky 302
Activated alumina adsorption. G. L. Simpson *310
Activated carbon adsorption. C. L. Mantell *305
Calcium chloride for dehydrating air and other gases *304

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.

Carbon dioxide from flue gases by Reich absorption process. G. T. Reich *152
Choice of dehydration methods. J. C. Patterson *313
Cleaning equipment *321
Compression equipment. Z. G. Deutsch *137
Condensation by refrigeration. J. W. Hunter *300
Continuous gas indicator (E.N.)..... *182
Dehydration methods *312
Drying of air and gases by dehumidification discussed at A.S.M.E. meeting *228
Fire-hazard properties of certain inflammable liquids, gases and solids (table) 31
Heat transfer surfaces. C. M. Ashley *319
Humidification processes..... *315
Gas and coal products consumption, production (charts & tables) 1938 82
Liquefied petroleum gas code revised 571
Liquid-gas contactors. H. F. Johnstone *322
Lithium chloride for absorbing moisture from air (chart)..... *302
New psychrometric chart. D. F. Othmer 296
"Protecting inefficiency". D. M. Rugg (c) 132
Recovery of solvent vapors. A. B. Ray *329
Removal of hydrogen sulphide from natural gas-flow sheet..... *37
Report on conditioning of gases and air *285-332
Silica gel adsorption. F. C. Dehler.. *307
Synthetic rubber from petroleum gases. Dexter North *220
Types of psychrometric charts..... 293
Use of psychrometric principles. Barta & Garber (charts).... 287; correction 512
Gas absorber (E.N.)..... *356
Gasoline—Solutizer—a new principle applied to gasoline sweetening. L. R. Border 776
Germany—Ersatz raw materials for German H_2SO_4. Karl Falk..... *333
Plans more intensive agricultural effort to meet war-time food demands 260

Glass:
Heat transfer coefficients in glass exchangers. Thompson & Foust..... *410
correction 512
Maintenance organization at glass works. Vaksdal & Kriger (chart).. *855
Makers of glass, glass-lined and fused-silica equipment 604
Physical properties of low-expansion glasses, fused quartz and fused silica (table) 604
Gloves, neoprene (E.N.)..... *563
Glycerine, synthetic, from petroleum. E. C. Williams & others..... *834
Graphical integration. J. H. Wiegand (P.N.) 480
Graphite—Structural carbon and graphite (tables) 607
Great Britain—Industry at war. P. I. Smith *12
Grinder, cutting type (E.N.)..... *114
Gunite reinforcement (E.N.)..... 634

H

Heat—Design and operation of a Dowtherm system. R. E. Hulme..... *685
Heat-resistant materials of construction report with supplement..... *597
Heating system (E.N.)..... *785
Still heater (E.N.)..... *788
Heat exchangers—Economy in tube grouping in round-shell exchangers. Z. G. Deutsch *538
Heat transfer—HTS, a mixture of inorganic salts, is a new heat transfer medium. Kirst, Nagle & Castner.. *472
Heat transfer coefficients in glass exchangers. Thompson & Foust..... *410
correction 512
Heat transfer surfaces. C. M. Ashley.... *319
Heaters—Immersion heater (E.N.)..... *492
Tantalum (E.N.) *355
"Heating tower" (P.N.)..... 632
High pressure vessels. T. McLean Jasper *784
Hoist, air-cooled electric (E.N.)..... *697
Homogenizing unit (E.N.)..... *116
Hopper—determining slope of intersection of two slanting hopper sides. Leonard Shapiro (P.N.)..... *632
Hopper intersection angle solved with compound angle graph. P. W. Jacobsen (P.N.) 480
HTS, a mixture of inorganic salts, is a new heat transfer medium. Kirst, Nagle & Castner..... *472
Humidity damage to buildings and means for its prevention. Downs & Spiselman *620
Hydrofluoric acid handling..... *542
Hydrogen-ion equipment (E.N.)..... 635
Hydrogen ion measurement report..... *553
Hydrogen sulphide removed from natural gas-flow sheet *37

I

Impeller, agitating (E.N.)..... *698
Indicator, flow rate (E.N.)..... 117
Inventions, see Patents
Italian autarchy almost achieved. Giacomo Fauser *10

J

Jack, flange (E.N.)..... *355
Japan—rayon and textile industries suffer from lack of cellulose pulp and dyes 44
Japan will invite American bids for equipping coal liquefaction plant..... 191
Joint, compact expansion (E.N.)..... 182
High-pressure (E.N.)..... *36
Swing (E.N.)..... *564

K

Kettle, automatic processing (E.N.)..... *562
Kettle, electric process (E.N.)..... *114
Kneading machinery (E.N.)..... *423

L

Labor:
International Council formed under the A. F. of L. 713
Operation and management in making war-time chemicals. King, Bennett, Harney, Meller, Dooley, Jasper *762
Organizers are attempting to unionize the chemical industry (ed)..... 528
Unionization of chemists (c)..... 805
Wage hour interpretations and exemptions 499
Lactic acid and casein flow sheet..... *427
Laminating phenolic plastic flow sheet—Micarta *183
Leather—Artificial leather from chemicals. M. E. Clark..... *544
Hydrogen ion measurement report... *553
Lighting—Chem. & Met. report on plant lighting *25
High-capacity lamp (E.N.)..... *698
Incandescent lamps bake paint. Bennett & Haynes..... *106
Sealed fluorescent (E.N.)..... *696
Liquids—Empirical equation for correlation of chemical engineering test data. D. S. Davis (P.N.)..... *249
Lithium chloride for absorbing moisture from air (charts) *302

Lubrication:
Chem. & Met. report on plant lubrication *171
Electric (E.N.) *251
Fatty acid panorama. Gordon McBride (charts) *830
Furfural refining of lubricants flow sheet *859
Hot conveyor lubrication (P.N.)..... 431
Lubricants — Making lubricants with chemicals added. D. M. Considine. *230
Lubricator, automatic (E.N.)..... *490
Oil pressure unit (E.N.)..... *697
Valve lubrication. G. F. Scherer..... *164

M

Magnesium—Dow Chemical Co. and magnesium development (ed)..... 596
Magnetic equipment (E.N.)..... *636

Maintenance:
Coke plant avoids breakdown by good maintenance organization. F. D. Lohr (chart) *857
Diversified repair problems in chemicals manufacture. Miller & King (chart) *853
Glass works maintenance. Vaksdal & Kriger (chart)..... *855
Pulp mill finds good organization essential. V. F. Waters..... *856
Report on maintenance in process industries ser. A No. 8..... *851
Sugar mill maintenance organization. Dan Gutleben (chart)..... *854

Management:
Executive vs. technologist. W. B. Bell, E. C. Williams..... *156
For engineering executives (ed)..... 147
Going into business for yourself. A. R. Maas *781
Operation and management in making war-time chemicals. King, Bennett, Harney, Meller, Dooley, Jasper.... *762
Organization chart of a modern integrated oil refining company..... 421
Organization chart for a research department as used by American Cyanamid Co..... 760
Planning for cost reduction in an industrial engineering plant (chart) 476
Rules for an executive. D. J. Mack (c) 370
Manufacturing Chemists' Association meets in Pennsylvania 434

Materials Handling:
Alumina straight line production with conveyors. J. A. Lee..... *674
Hydrofluoric acid handling..... *542
Nitrocellulose handling precautions... 619

Materials of Construction:
Materials of construction report with supplement ....*598; Correction... 806
New developments and trends in materials of construction. J. A. Lee... *597
Obsolescence of materials. G. M. Read (c) 578
Porcelainware pipes and valves in phenol plant. T. R. Olive..... *770
Selecting materials of construction. H. L. Maxwell 471
Welded steel vacuum pans for salt refining instead of cast iron, show little corrosion. J. A. Lee..... *530
What metals to use with acetic acid. Pavlis & Rohrman..... *779
Melamine discussed at American Chemical Society 653
Metals—Materials of construction report with supplement *597
Meters—Area type (E.N.)..... *423
Industrial, with pH recorder. V. F. Hanson (P.N.) *169
pH quinhydrone meter (E.N.)..... 561
Rotary displacement (E.N.)..... *180
Methanol—Production of methanol (table) 1938-1939 86
Micarta flow sheet..... *183
Mill—Fluid impact (E.N.)..... *357
Heavy duty plastics (E.N.)..... *251
Minerals—Vital industrial minerals (ed). 148

Mixing:
Experimental mixer (E.N.)..... *786
Flocculating mixer (E.N.)..... *181
Horizontal mixer (E.N.)..... *424
Mixer with clamp..... *181
Two-motion mixer (E.N.)..... *490
Molding press (E.N.)..117; *356; *696
Motor-generator conversion devices for electro-Chemical Loads. C. C. Levy..... *344

Motors
"Lo-Amp" motor (E.N.)..... *426
Pyramid-mounted motor generator set (E.N.) *252
Synchronous motor (E.N.)..... *425
Variable speed (E.N.)..... *33
Variable speed drive (E.N.)..... *117
Multi-processing unit (E.N.)..... *491

Munitions:
Chemical munitions plants—a lesson in economic geography. A. R. Ginsburgh *768
Man-power for munitions (ed)..... 527
Munitions plants in national defense program (map & table)..... 643
National defense to make military explosives (chart) 744
Petroleum toluol for national defense. *535
Revised status of the Army's munitions plants 795
Role of chamber sulphuric acid in making munitions. A. M. Fairlie.. *839

N

National Container Association receives consent decree from Department of Justice (ed) 284
National defense, see War
National Defense Research Committee—Plans for defense research..... 498
Natural gas—New gas purification plants announced 64
Neohexane for 100 octane plus. M. E. Clark *225
Niagara-Buffalo area—chemical process industries. MacMullin, Koethen & Richardson *338
Nitrocellulose handling precautions..... 619
Nitrogen and nitrates—Consumption, distribution, production of fertilizers (charts & tables) 1937-1939..... 72
No statistics from Great Britain (ed). 62
Nomographic chart for determining gas flow rates from orifice meter readings. Winnicki & Koch (P.N.).... 24
Nomographic chart for determining liquid flow rates from orifice meter readings. Winnicki & Koch (P.N.).... 24
Nomographic chart for precise determination of mol fractions from weight percentages. Winnicki and Chellis. (P.N.) 694
Non-ferrous alloys as materials of construction report with supplement..... *597
Nylon—American Chemical Society discusses nylon 650
Nylon plant operations (picture feature) 628

O

Obsolescence—Depreciation vs. obsolescence. R. M. Fischer (c)..... 578
Materials obsolescence. G. M. Read (c) 578
Odor adsorber (E.N.)..... *252

Oils:
Factory consumption of oils and fats in 1939 261
Fatty acid panorama. Gordon McBride (charts) *830
Menhaden fishing industry makes advances in centrifugal processing of oil. J. H. Smith..... *99
Production, consumption, stocks, distribution of fats and oils (charts & table) 1937-1939 87
Oil burner, proportioning (E.N.)..... 182
Organic chemicals—production and sales (charts & table) 1935-1938..... 80
Orifice charts. Winnicki & Koch (P. N.) 24

P

Packing, braided (E.N.)..... *562
Packaging—Developing a new container for a chemical product. R. W. Lahey *110

Paints:
Baking paint with near infra-red. Bennett & Haynes..... *106
Humidity damage to buildings and means for its prevention. Downs & Spiselman *620
Paints, varnishes, lacquers and fillers sales 1937-1939 (chart)..... 76

Patents:
College control of patents (ed)..... 149
Good tool wrongly used (ed)..... 219
Military inventions—beat Congress to the draw (ed)..... 218

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.

Petroleum:
HTS, a mixture of inorganic salts, used in Houdry catalytic cracking units. Kirst, Nagle & Castner....*472
Neohexane for 100 octane plus. M. E. Clark *225
Opportunities in the petroleum industry report *415
Polyform process for refining petroleum is introduced by Gulf Oil Corp.*626
Synthetic glycerine from petroleum. E. C. William & others....*334
Synthetic rubber from petroleum gases. Dexter North....*220
Toluol produced from petroleum for national defense....*535
Toluol production (chart & table).... 573
What price toluol? (ed).... 529
Phenol—Flow sheet for phenol vapor phase regenerative process....*789
Synthetic phenol made by vapor phase regenerative process. T. R. Olive *770
Phosphoric acid—Viscosity of strong phosphoric acids. D. S. Davis.... 155
Pillow block, anti-friction (E.N.)....*489
Pipes—Connectors (E.N.) *250
Pipes and valves of porcelainware in phenol plant. T. R. Olive....*770
Rubber-line (E.N.) *561
Stainless industrial fittings (E.N.)... 250

Plant Notebook:
Charts solve orifice equations. Winnick & Koch (P.N.).... 24
Determining slope of intersection of two slanting hopper sides. Leonard Shapiro *632
Dryer heat recovery.... 632
Empirical equation for correlation of chemical engineering test data. D. S. Davis *249
Fallacy of oversize steam mains for process steam supply. J. O. G. Gibbons *118
Hopper intersection angle solved with compound angle graph. P. W. Jacobsen (P.N.) 480
Hot conveyor lubrication.... 431
How to use available recorders for continuous records with indicating pH meters. V. H. Hanson....*169
Neoprene for fan coating increases capacity 118
Nomographic chart for precise determination of mol fractions from weight percentages. Winnicki & Chellis 694
Nomographic plotting proves convenient for vapor pressure and composition data. D. F. Othmer... 631
Plotting vapor pressure data for aqueous ammonia. D. F. Othmer..*551
Pointers on the choice of reducing valves for supplying process steam. J. O. G. Gibbons.... 431
Simple graphical integration. J. H. Wiegand 480

Plants:
Design and construction of chemical plants in periods of emergency. Harcourt, Gray, Low, Ryan, Emerson, Alther, Geist, Ferguson....*765
Sites of 15 government defense plants (map) 769
Where are the plants that make chemicals? (chart) 756

Plastics:
Brazil will use coffee to make plastics 187
Corrosion-resistant plastics—representative makers 606
Laminating phenolic plastic flow sheet—Micarta *183
List of synthetic rubbers manufactured commercially. Dexter North.*220
Masonite products from wood. J. A. Lee *95
Production, sales of plastics (tables) 1933–1937 78
Synthetic rubber from petroleum gases. Dexter North....*220
Plating—Hydrogen ion measurement report *553
Polyform process for refining petroleum.*626
Power show report....*844
Power transmission—Report on mechanical power transmission *481
Press, injection molding (E.N.)....*36

Prices:
Chem. & Met. weighted index of prices 57, 143, 212, 279, 386, 452, 522, 590, 734, 818, 887
Current prices....58, 144, 214, 280, 388, 454, 524, 592, 736, 820, 891
How wars have affected wholesale prices in U. S. since 1800 (chart).. 65
U. S. Bureau of Labor devices new price index 358
What of the aftermath? (ed)..... 673
Production—Trends of production and consumption 56, 142, 210, 277, 384, 450, 520, 589, 732, 816, 893
Psychrometer, hand aspirated (E.N.)....*116

Pulp and Paper:
Cigarette paper made in America.... 240
Good organization essential in pulp mill work. V. F. Waters....*856
Hydrogen ion measurement report....*553
Opportunities in the pulp and paper industry *242
Paper price probe.... 569
Pulp washer (E.N.)....*250
Scandinavian pulp no longer imported (ed) 283
Sodium chlorite produces stronger, whiter paper *630

Pumps:
Duplex diaphragm pump (E.N.).....*490
Large proportioning (E.N.).....*698
Midget pump (E.N.).....*635
Multi-stage pump (E.N.).....*698
Neoprene rotary (E.N.).....*633
Packless pump (E.N.).....*564
Paper stock (E.N.).....*182
Portable submersible (E.N.).....*115
Proportioning (E.N.) *356
Pumping equipment for chemical process use. G. L. Montgomery...*840
Rotary (E.N.) *355
Slip pump (E.N.).....*697
Streamlined pump (E.N.).....*181
Stuffing boxless pump (E.N.).....*491
Water supply equipment in the process industries. G. L. Montgomery *680
Purdue University's new building for School of Chemical and Metallurgical Engineering *395
Pyrometer, optical (E.N.)..... 117
Pyrometer, portable (E.N.).....*364

R

Raw chemical materials—Chem. & Met. report on raw materials..... *63

Rayon:
Flow sheet for production of synthetic amyl alcohol and from it the acetate *493
How an acetate rayon plant assures fire protection. M. B. Morgan.....*403
Japanese rayon and textile industries suffer from lack of cellulose pulp and dyes 44
Production, consumption of rayon 1920–1939 (charts & table)..... 77
Recorder for industrial pH meters. V. F. Hanson (P.N.) *169
Recorder, redesigned (E.N.).....*564
Rectifier—Ignition, in the chemical industries. C. C. Levy.....*344
Selenium (E.N.) *36

Refining:
Furfural refining of lubricants—flow sheet *859
HTS, a mixture of inorganic salts, used in Houdry catalytic cracking units. Kirst, Nagle & Castner.....*472
Making lubricants with chemicals added. D. M. Considine.....*230
Modern sugar refining flow sheet.... *119; correction 371
Opportunities in the petroleum industry report *415
Polyform process for refining petroleum is introduced by Gulf Oil Corp.*626
St. Clair, Mich. refinery produces salt in three different ways. J. A. Lee.*530
Refractories—Makers of refractories and high temperature mortars 607
Physical properties of refractory materials (table) 606
Refrigeration — Compression equipment. Z. G. Deutsch.....*317
Condensation by refrigeration. J. W. Hunter *300
Refrigeration machines, new (E.N)..... 180

Research:
Banking on research (ed) 825
Commercial testing laboratories told that they have no place in government's program (ed)..... 595
Executive vs. technologist. W. B. Bell, E. C. Williams.....*156
For "purer" research (ed)..... 218
Our first line of national defense as shown by American Cyanamid Co.'s research laboratory. M. E. Clark..*757
Research—Our greatest resource (ed). 391
Trail of the Forty-niners (ed)..... 149
Resin—Synthetic resins for surface coatings. J. A. Lee.....*334
Synthetic resins; production and sales (table) 1938 79
Rosin—Consumption, production of rosin and turpentine (tables) 1938–1939. 91
Rotor, "Valv-amp" (E.N.)..... 356

Rubber:
Chemical and physical properties and makers of rubber and like products (tables) 610
List of synthetic rubbers manufactured commercially. Dexter North.*220
Synthetic rubber developed by Germany 189
Synthetic rubber discussed at American Chemical Society..... 651
Synthetic rubber from petroleum gases. Dexter North.....*220
Synthetic rubber production (ed).... 458
Rubber-metal bond (E.N.).....*250

S

Safety:
Carbide & Carbon tests equipment to prevent accidents. J. J. Duggan..*678
Explosions that weren't planned. Ernst Berl *236
Extinguishing fires in the chemical industry *548
Handling hydrofluoric acid.....*542
How an acetate rayon plant assures fire protection. M. B. Morgan.....*403
Lighting survey for chemical plants 25
Making defense plants safer..... 722
Safety and fire prevention in chemical industry *700
Safety education. G. C. McCarten (c) 805
Salt—Flow sheet for salt production....*565
St. Clair, Mich. refinery produces salt in three different ways. J. A. Lee.*530
Salt cake—Production of salt cake in 1939 86
Sand clarifier (E.N.).....*562
Screen, electro-deposited (E.N.).....*114
Screen, miniature vibrating (E.N.).....*180
Separation—Bulk centrifugal (E.N.)..... *34
Centrifugal processing of menhaden fish oil makes advances. J. H. Smith *99
Magnetic separator (E.N.)..... 787
Sheet metal construction (E.N.).....*696
Sifter, brush (E.N.).....*562
Silica gel adsorption for drying air. F. C. Dehler.....*307
Soda ash—Caustic soda and soda ash in peacetime *750
Distribution, production of soda ash (charts and table) 1937–1939..... 71
Sodium carbonate—Church & Dwight completes new plant at Syracuse..*109
Specific gravity and viscosity of NA_2CO_3 solutions. D. S. Davis.....*690
Sodium chlorate—Sodium chlorate cell design. Groggins, Pittman & Davis..*468
Sodium chlorite produces stronger, whiter paper *630
Solutizer applied to gasoline sweetening. L. E. Border.....*776
Solvents—Fire hazard properties of certain flammable liquids, gases and solids (table) 31
Recovery of solvent vapors. A. B. Ray *329
Southern chemical activity. J. A. Lee..*826

Soybeans:
Chart showing the family of soybean derivatives, their production..... 615
Chemical engineering advances in soybean processing. G. W. McBride *614; correction 694
Chemicals from soybeans..... 240
Leather finish and wallboard from soybean meal 240
Soybeans in the U. S. 1924–1938 (chart) 88
Speed reducers—Report on mechanical power transmission *481
Speed variator (E.N.).....*636
Steam mains for process steam supply. J. O. G. Gibbons (P.N.)..... 118
Steam trap, large (E.N.).....*116
Steel—Comparative prices of stainless steels (table) 603
Sterilamp discussed at Electrochemical Society meeting 693
Strategic materials, see War..... 47
Sugar—Beet sugar developments. R. W. Shafer *464
Hydrogen ion measurement report..*553
Maintenance organization for the sugar mill. Dan Gutleben (chart)..*854
Modern sugar refining flow sheet *119; correction 371
Sulphur—Sulphuric acid and sulphur in peacetime *748

Sulphuric Acid:
Bubble phase absorption of sulphuric acid fog *541
Distribution, production of sulphuric acid (charts & tables) 1937–1939.. 69
Ersatz raw materials for German H_2SO_4. Karl Falk.....*333
Fertilizer practice at Davison Chemical Corp. R. S. McBride..... *4
Role of chamber sulphuric acid in making munitions. A. M. Fairlie..*839
Sulphur and sulphuric acid in peacetime *748
Superphosphates—Granulated phosphatic fertilizer produced by Davison Chemical. Mackall & Shoeld.....*102
Switch—Electric furnace (E.N.).....*180
Explosion-proof (E.N.) *697
Micro (E.N.) *357

T

Tanks:
Butane handling tank (E.N.).....*562
Construction with sulphur cement. Payne & Duecker.....*20
Lead-lined tank cars (E.N.).....*490
Motor truck tank for corrosive solution *113
Rubber-lined (E.N.) *563
Watch out for tanks in floods (ed).. 219
Tariffs—Clashing philosophies of government and trade (ed)..... 61
Taxes—More federal taxes (ed)..... 459
Thermocouple, radiation-type (E.N.).....*252
Time and motion study—Chemical work simplification. J. R. Bailey..... 18
Timer, flexible (E.N.).....*786
Toluol produced from petroleum for national defense *535
Toluol production (chart & table)..... 573
Transformer, variable auto (E.N.)..... *35
Transportation—Mobilizing traffic plans (ed) 62
Truck, barrel (E.N.).....*561
Truck, carboy (E.N.).....*563
Trucks—Ford truck (E.N.)..... 633
Tubes, Illium thermocouple (E.N.).....*564
Turpentine—Consumption, production of turpentine and rosin (tables) 1938–1939 91

U

U. S. Chemical Warfare Service—organizing for chemical preparedness...*460

V

Valves:
Choice of reducing valves for supplying process steam. J. O. G. Gibbons (P.N.) 431
Diaphragm control (E.N.).....*426
Heating device for valves (E.N.)....*635
High temperature (E.N.)..... 697
Lubrication of valves. G. F. Scherer.*164
Self-contained reducing (E.N.)..... *34
Small steel (E.N.).....*492

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.

Spinning-disk valve (E.N.).....*179
Steel valve (E.N.).....*181
U-bolt gate (E.N.)..... 33
Valve operator (E.N.).....*115
Vapor pressure data plotted for ammonia solutions. D. F. Othmer (P.N.)..*551
Vapor pressure nomograph for aqua ammonia solutions. D. F. Othmer (P.N.) 631
Vaporization equilibria. Mitchell Gilbert (chart) *234
Vibrator, explosion-proof (E.N.).....*179
Vibrators for electric cars (E.N.).....*633
Vinyon discussed at American Chemical Society 650
Vistanex, see Rubber
Vulcanizer (E.N.) *788

W

War:
An important distinction in chemical preparedness (ed) 392
Challenge to industry's patriotism calls for plain speaking. J. H. McGraw, Jr.....596a
Chemical munitions plants—a lesson in economic geography. A. R. Ginsburgh *768
Chemicals in the national economy—report by Chemical & Metallurgical Engineering (chart).....*741
Design and construction of chemical plants in periods of emergency. Harcourt, Gray, Low, Ryan, Emerson, Alther, Geist, Ferguson....*765
Employers urged to prepare for replacing drafters 722
Engineering committee for defense training 711
Explosives to be made by national defense (charts) 744
Fighting the saboteur (ed)..... 672
Industry organizes for national defense. J. H. McGraw, Jr.....391a
Make haste slowly in the drive for production (ed) 671
Makings of good inspectors (ed)..... 672
Man-power for munitions (ed)..... 527
Munitions plants in national defense program (map & table).....643; 712
Occupational deferment (ed)..... 824
Operation and management in making war-time chemicals. King, Bennett, Harney, Meller, Dooley.....*762
Organizing for chemical preparedness *460
Plant option plan of financing proposed by the National Defense Advisory Commission (ed)..... 595
Preparedness and the engineer (ed).. 739
Preparedness begins at home (ed)... 457
Preparedness of D-day (ed)..... 823
Preparing for conscription (ed)..... 673
Sabotage precautions (ed)..... 824
Safety measures recommended for defense plants 723
Strategic material list..... 502
Strategic materials placed under export license 499
Toluol produced from petroleum for national defense *535
What you can do for national defense. M. E. Barker.....*462
World chemicals plant construction affected by war developments last year 715
World War I vs total defense (chemically speaking) 752
Waste disposal—Hydrogen ion measurement report *553
Pulp and paper industry considers waste disposal 247
Waste elimination—Simplification of chemical work. J. R. Bailey..... 18
Water—How process industries are meeting their water supply problem. G. L. Montgomery.....*622
Modern methods of water supply pumping. G. L. Montgomery.....*680
Weighted average hardness as calcium carbonate of large water supplies in various states..... 624
Water treatment—Distilled water system for pharmaceutical company. A. A. Ross *100
Hydrogen ion measurement report..*553

Welding:
Fittings for welding (E.N.)..... 357
Perfect fits for perfect welding. H. S. Card *400
Remote-controlled arc welder (E.N.).*636
Welder, portable a.c. (E.N.).....*696
Western opportunities for chemical engineers. P. D. V. Manning..... 613
White-print machine (E.N.).....*423
Wire, braidless insulated (E.N.)..... 357
Wood—Masonite products from wood. J. A. Lee *95
Wood for chemical equipment (tables) 612

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.

Author's Index

ABBEY, Sydney. "Young ideas"..... 267
Aither, J. R. Avoid specialties in periods of emergency 767
Ashley, Carlyle M. Heat transfer surfaces *319

BAILEY, J. R. Chemical work simplification 18
Barker, M. E. What you can do for national defense *462
Barta, Edward J. & H. J. Garber. Use of psychrometric principles..... 287
Bell, William Brown. What management thinks *156
Bennett, H. J. & Howard Haynes. Paint baking with near infra-red.....*106
Bennett, J. L. Give adequate training in making war-time chemicals..... 763
Benson, G. New acetic anhydride process.*150
Berl, Ernst. Explosions that weren't planned *236
Bichowsky, F. Russell. Absorbent solutions 302
Border, L. E. Solutizer—a new principle applied to gasoline sweetening...*776
Bowman, R. E. Twilight zone in education (c) 370

CARD, Harold S. Perfect fits for perfect welding *400
Castner, J. B., W. E. Kirst & W. M. Nagle. New heat transfer medium *472
Chellis, L. N. & H. S. Winnicki. Nomographic chart for precise determination of mol fractions from weight percentages 694
Clark, Melvin E. Leather cloth from chemicals *544
Neohexane for 100-octane plus.....*225
Research—our first line of national defense *757
Considine, D. M. How specialty lubricants are made *230
Crass, M. F., Jr. Drum construction....*578

DAVIS, Dale S. Specific gravity and viscosity of NA_2 CO_3 solutions..*690
Useful empirical equation for correlation of chemical engineering test data *249
Viscosity of strong phosphoric acids. 155
Davis, F. H., P. H. Groggins & A. L. Pittman. Sodium chlorate cell design *468
Dehler, F. C. Silica gel adsorption....*307
Deutsch, Z. G. Compression equipment..*317
Economy in tube grouping in round-shell exchangers *538
Dooley, C. R. Train workers in making war-time chemicals 764
Downs, C. R. & J. W. Spiselman. Humidity damage to buildings and means for its prevention.....*620
Duecker, W. W. & C. R. Payne. Construction with sulphur cement... *20
Duggan, James J. How carbide tests equipment to prevent accidents.*678

EMERSON, C. L. Eliminate restrictions in periods of emergency..... 766

FAIRLIE, Andrew M. Role of chamber sulphuric acid in making munitions *339
Falk, Karl. Ersatz raw materials for German H_2 SO_4.....*333
Fauser, Giacomo. Italian autarchy almost achieved *10
Ferguson, Harold K. Problems of industry in periods of emergency.. 767
Fischer, R. M. Depreciation vs. obsolescence 578
Foust, Alan S. & T. J. Thompson. Heat transfer coefficients in glass exchangers *410

GARBER, Harold J. & E. J. Barta. Use of psychrometric principles.. 287
Gary, T. C. Simplify designs of chemical plants under emergency conditions 765
Geist, Walter. New Equipment in periods of emergency 767
Gibbons, James O. G. Fallacy of oversize steam mains for process steam supply *118
Pointers on the choice of reducing valves for supplying process steam 431
"Young ideas" 267
Gilbert, Mitchell. Vaporization equilibria.*234
Ginsburgh, A. Robert. Chemical munitions plants—a lesson in economic geography *768
Groggins, P. H., A. L. Pittman & F. H. Davis. Sodium chlorate cell design *468
Gutleben, Dan. Informality favored in sugar mill work.....*854

HANSON, V. F. How to use available recorders for continuous records with indicating pH meters.....*169
Harcourt, Guy N. Sense of proportion in this emergency 765
Harney, T. R. Increasing production in making war-time chemicals..... 763
Haynes, Howard & H. J. Bennett. Paint baking with near infra-red.....*106
Hess, C. B. Extinguishing sodium fires.. 805
Hixon, Arthur W. Review of book..... 49
Hougen, O. A. Typical dryer calculations .....pt. 1, *15; pt. 2 *160
Hulme, Richard E. Notes on the design and operation of a high temperature Dowtherm system.....*685
Hunter, James W. Condensation by refrigeration *300

JACOBSEN, P. W. Hopper intersection angle solved with compound angle graph 480
Jasper, T. McLean. High pressure vessels 784
Johnstone, H. F. Liquid-gas contractors.*322

KING, B. F. & W. E. Miller. Diversified repair problems in chemicals manufacture *853
King, Victor L. No deviation advisable in making war-time chemicals 762
Kirkpatrick, Sidney D. Service through chemical change *394
Kirst, W. E., W. M. Nagle & J. B. Castner. New heat transfer medium.*472
Koch, Ralph & H. S. Winnicki. Charts solve orifice equations..... 24
Koethen, F. L., R. B. MacMullin & C. N. Richardson. Chemical industry on the Niagara frontier.....*338
Kriger, F. S. & A. Vaksdal. Foreman authority stressed at glass works.*855

LAHEY, R. W. Packaging the new product *110
Lee, Chesman A. More on flow through bins *198
Lee, James A. Chemical activity in the deep South *826
Making alumina at Mobile.....*674
New developments and trends in materials of construction.....*598
New products from wood..... 95
A salt for every use.....*530
Synthetic resins for surface coatings *334
Levy, C. C. Conversion devices for electrochemical loads *344
Lohr, F. D. Avoiding breakdown in a coke plant *857
Low, Albert S. Welded structures.....*766

MAAS, Arthur R. Going into business for yourself *781
Mack, David J. Rules for an executive (c) 370
Mackall, J. N. & Mark Shoeld. Granulating phosphate fertilizers.....*102
MacMullin, R. B., F. L. Koethen & C. N. Richardson. Chemical industry on the Niagara frontier.....*338
Manning, Paul D. V. Western opportunities for chemical engineers..... 613
Mantell, Charles L. Activated carbon adsorption *305
Modern chlorine practice.....*166
Maxwell, Dr. H. L. Selecting materials of construction 471
McBride, Gordon W. Chemical engineering advances in soybean processing *614
Fatty acids panorama.....*830
McBride, R. S. Fertilizer practice at Curtis Bay *4
McCarten, G. C. Safety education..... 805
McGraw, James H., Jr. Challenge to industry's patriotism calls for plain speaking 596a
Industry organizes for national defense 391a
Meller, H. C. Preserve health in making war-time chemicals 764
Miller, W. E. & B. F. King. Diversified repair problems in chemicals manufacture *853
Montgomery, Graham L. How process industries are meeting their water supply problem *622
Pumping equipment for chemical process use. *840
Water supply equipment in the process industries *680
Morgan, M. Bernard. How an accurate rayon plant assures fire protection *403
Murray, R. L. Alkali-chlorine developments *396

NAGLE, W. M., W. E. Kirst & J. B. Castner. New heat transfer medium *472
North, Dexter. "Rubber" from petroleum gases *220

OLIVE, Theodore R. Phenol made by vapor phase regenerative process.*770
O'Tash, P. Auditors and engineers..... 48
Othmer, Donald F. New psychrometric chart 296
Nomographic plotting proves convenient for vapor pressure and composition data 631
Simple plot for partial pressure and vapor composition data for aqueous ammonia *551

PATTERSON, James C. Choice of dehydration methods *313
Pavlis, Frank & F. A. Rohrman. What metals to use with acetic acid...*779
Payne, C. R. & W. W. Duecker. Construction with sulphur cement..... *20
Pittman, A. L., P. H. Groggins & F. H. Davis. Sodium chlorate cell design *468

RAY, Arthur B. Recovery of solvent vapors. *329
Read, Granville M. Materials obsolescence 578
Reich, Gustave T. Alkalo slurry for CO_2 recovery *152
Richardson, C. N., R. B. MacMullin & F. L. Koethen. Chemical industry on the Niagara frontier ...*338
Rohrman, F. A. & Frank Vavlis. What metals to use with acetic acid...*779
Ross, Auburn A. Design for distilled water *100
Rugg, Dan M. "Protecting inefficiency". 132
Ryan, W. F. Conserve brains in periods of emergency *766

SANDSTROM, C. O. Avoiding clogged bin hoppers *22
Schaphorst, W. F. Avoiding clogged bin hoppers 132
Scherer, George F. Consideration in valve lubrication 164
Shafor, Ralph W. Process economy emphasized in recent beet sugar development *464
Shapiro, Leonard. Determining slope of intersection of two slanting hopper sides *632
Shoeld, Mark & J. N. Mackall. Granulating phosphate fertilizers.....*102
Simpson, G. L. Activated alumina adsorption *310
Smith, J. Howard. Advances in Menhaden reduction *99
Smith, Paul I. British industry at war. *12
Spiselman, J. W. & C. R. Downs. Humidity damage to buildings and means for its prevention.....*620
Straub, Frederick G. New trends in boiler feedwater treatment.....*477
Strobel, J. J. Magic as an engineer's hobby 48
Switz, Theodore M. Older ideas, same subject 131

THOMPSON, T. J. & A. S. Foust. Heat transfer coefficients in glass exchangers *410
Toulmin, H. A., Jr. Plus engineering.. 48

VAKSDAL, A. & F. S. Kriger. Foreman authority stressed at glass work *855

WATERS, Vincent F. Good organization essential in pulp mill work.*856
Wells, J. R. How to utilize waste energy 132
Wiegand, James H. Simple graphical integration 480
Williams, Evan Clifford. From the research viewpoint *157
Williams, E. C. & others. Synthetic glycerine from petroleum.....*834
Winnicki, H. S. & L. N. Chellis. Nomographic chart for precise determination of mol fractions from weight percentages 694
Winnicki, Henry S. & Ralph Koch. Charts solve orifice equations..... 24

NOTES—(c) Comment; (ed) Editorial; (E.N.) Equipment News; *Illustrated; (P.N.) Plant Notebook.